

7. It should be expected that many stations would elect to build lowered powered second channels, helping to preserve LPTV and Full Service TV.
8. The Commission has never documented the amount of greater spectrum reuse, or the lower cost of equipment, that would result from reallocating a contiguous band of spectrum.
9. Full power stations would be pleased to buy a temporary ATV transmitted as small Low Powers, instead of bankrupting themselves building new facilities. At the end of the transition period, the larger retained channel would then be upgraded to ATV.
10. Many Full Powers are marginal stations. Allowing them to convert on-channel, rather than building a whole new transition plant, may be the only way such stations can afford to participate in the transition to digital.

AN ADDITION TO THE ABOVE REGARDING PROTECTION

1. The second channel would have less protection from other LPTV stations than the existing NTSC channel. The advantage is that full service stations would displace fewer LPTV stations. The disadvantage is that full service stations would be less able to match coverage of their existing stations.
2. The protection ratios could change after the full service station shuts down and returns the license for one of the two stations.

OPTION: EXPANSION OF THE TV BAND

1. Several channels reserved for TV broadcasting have been set aside for possible land mobile use. These channels should be made available to TV during the transition period.
2. Following the transition, after the second channel is returned, the use of these channels could be reconsidered.
3. It is clear that some kind of digital compression can save considerable spectrum in two way land mobile. On a phone line, using a 28.8 Kb/s modem, spectrum occupied is 2.8 KHz. Yet in that narrow bandwidth one can transmit good quality radio programming using audio codes like Real Audio or Xing Technologies.
4. Lower quality is required by two way land mobile, requiring less bandwidth. Yet present spectrum allocations are much greater per channel.
5. In addition, Code Division Multiple Access, a method of Spread Spectrum is very adaptable to Land Mobile, which will allow far greater efficiency in use of the spectrum. A proceeding to discover these potentials should be instituted by the FCC.

OPTION: KEEPING ALL EXISTING CHANNELS

1. Existing channels should be kept. VHF transmission allows over the horizon reception, UHF does not. Rural areas will loose service VHF TV is eliminated.
2. If the government desires to auction spectrum, that can be done by allowing new TV broadcast channels to be awarded at auction. There is no reason to delete channels from regular over the air broadcast use.

OPTION: NTSC PROPAGATION MODELS OUTDATED

1. The FCC uses a propagation model created in the 1940's. It is amenable to manual operation. The model uses 8 radials at 45 degrees azimuth from one another. The average height of terrain over the radial from 2 to 10 miles from the transmitter is used to estimate the distance a signal contour will propagate.
2. The ERP and antenna height above the average height of each radial is compared to a table of values that were found to represent typical measurements taken in many early VHF situations.,
3. The problem with this model is that with the advance of computers, the availability of terrain data in computer readable form, and with advance in knowledge of radio wave propagation, the old FCC method is now extremely outmoded.
4. The model ignores terrain over 10 miles from a transmitter site. It cannot account for diffraction and other propagation effects. In some cases signals for farther, in others less far than that predicted by the present F(50/50) and F(50/10) charts.

THE GRAND ALLIANCE PERPETRATES HARMFUL APPROACH

5. The ATSC has proposed an F(50/90) chart that would slightly modify, but perpetuate the use of the old model.
6. A change to ATV is the best possible time to consider other, more accurate models. No model perfectly represents the real world. But a better model is needed.

LPTV ALLOTMENTS TAKE TERRAIN INTO ACCOUNT

7. LPTV now has, embodied in its procedures, recognition of terrain barriers as an allocation tool. That has allowed many stations to exist, that do not interfere with other stations, but that would be prohibited under the pure form of the old model.
8. It is now possible to apply a better model on a point to point basis over a wide geographic area. There are a variety of algorithms to chose from. We suggest that the FCC adopt the Institute of Telecommunications Studies, Tech Note 101 model (See National Bureau of Standards, Technical Note 101, Issued May 7th 1965, Revised Jan 7th, 1967; Rice, Longly, Norton, & Borsis).
9. The model would be specifically adopted to use a particular terrain database on a grid of points. Then the computer would connect points that represent the particular contour desired, such as 50% of the locations 90% of the time.
10. The widespread use of terrain shadow maps in the wireless cable (MMDS) industry demonstrates that computer engineering of terrain studies is now mature, economical and simple enough to incorporate at this time. Faced with the inability to accommodate 1800 broadcast licenses, now is surely the time to incorporate terrain shadowing as an ATV allotment planning factor.

CONSIDERATIONS ON INCREASING SPECTRUM EFFICIENCY

Trunking and cellular frequency reuse, code division of spread spectrum systems and time division multiplexing can greatly increase spectrum efficiency. Still, at some times of the day, even cellular spectrum is lightly used. The demand for land mobile communications changes by the hour.

Digital techniques can vary the compression ratio of land mobile, video and audio broadcast transmission. All could share the same spectrum. Allowing digital broadcasters to use the unoccupied land mobile channels during times the land mobile station is off the air should greatly improve efficiency. A quick scan with a spectrum analyzer in a large city can show how poor spectrum efficiency really is. At best the spectrum used by land mobile at any one moment might show 1 or 2% occupancy.

This would indicate that at any one moment, hundreds of Land Mobile megahertz are lying fallow. Allowing LPTV stations to occupy Land Mobile Spectrum on a secondary basis for digital communications during the silent time on a land mobile channel should stimulate an interesting new technology.

ISSUES RAISED BY CO-LOCATION

Co-Location raises structural and zoning problems. First, the FCC must impose zoning pre-emption to allow old towers to be rebuilt against present zoning codes. Second, some co-location will result on lousy coverage for the second channel. I.E., at Goose Bay (KIMO, KTUU, KAKM) here in Alaska, peak DTV UHF ERP must equal 40 megawatts to get similar coverage to VHF. They know they can't do that, and KAKM and KTUU and KIMO re now are working on securing new sites that will allow some preservation of their present coverage. Thus, this depends on the UHF second channel as the loaner.

Respectfully submitted,

The LPTV Industry